

CLAIMS.

WE CLAIM

1. A method of forming an outwardly grown aluminide diffusion coating on a superalloy substrate disposed in a coating chamber, comprising heating the substrate to a temperature of 900 to 1200 degrees C, flowing a coating gas comprising aluminum trichloride and a carrier gas through the chamber at a flow rate of the
10 coating gas of about 100 to about 450 standard cubic feet per hour, providing a concentration of aluminum trichloride in the chamber of less than 1.4% by volume of the coating gas in the chamber, and providing a total pressure of the coating gas in the chamber of about 100 to about 450 Torr.
2. The method of claim 1 wherein the flow rate of coating gas through the chamber is 200 to 400 standard cubic feet per hour, the concentration of aluminum trichloride is about 0.6 to about 1.2% by volume of the coating gas in the chamber, and the total
20 pressure of the coating gas in the chamber of about 100 to about 300 Torr.
3. The method of claim 2 wherein the flow rate of coating gas through the chamber is 300 standard cubic feet per hour, the concentration of aluminum trichloride is about 1.0% by volume of the coating gas in the chamber, and the total pressure of the coating gas in the chamber is about 200 Torr.
4. The method of claim 1 including before forming the coating on
30 the substrate, a layer comprising platinum is applied on the substrate.

5. The method of claim 1 wherein the coating gas comprises aluminum trichloride and balance hydrogen.
6. The method of claim 1 wherein the substrate is heated to a temperature of about 1080 degrees C.